Peripheral Vision - Scanning the Periphery

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How is your Peripheral Vision?

Scanning the Periphery with a strategic eye exam, which serves as a diagnostic tool for evaluating and sharpening companies peripheral vision.

Ask questions and think the unthinkable and far- feched scenarios:

- What future surprises could really hurt?
- What don't we know that might matter?

Use the Peripheral Vision Scoring Tool and assess your

- Need for Peripheral Vision
- Capability for Peripheral Vision

Organizations with good peripheral vision can gain tremendous advantages over rivals. They can recognize and act on opportunities more quickly. They can avoid being blindsided. It takes skill to do this well, but as the environment changes more quickly and becomes more uncertain, the payoffs from peripheral vision may be greater than ever.

As Charles Darwin said, "It's not the strongest of the species who survive, nor the most intelligent, but the ones most responsive to change."

Scanning the Periphery

by George Day and Paul J. H. Schoemaker

Between 2001 and 2004, Mattel lost 20% of its share of the worldwide fashion-doll segment to smaller rivals such as MGA Entertainment, creator of a hip new line of dolls called Bratz. MGA recognized what Mattel had failed to—that preteen girls were becoming more sophisticated and maturing more quickly. At younger ages, they were outgrowing Barbie and increasingly preferring dolls that looked like their teenage siblings and the pop stars they idolized. As the target market for Barbie narrowed from girls ages three to 11 to girls about three to five, the Bratz line cut rapidly into the seemingly unassailable Mattel franchise. Mattel finally moved to rescue Barbie's declining fortunes, launching a brand extension called My Scene that targeted older girls, and a line of hip dolls called Flavas to compete head-on with Bratz. But the

damage was done. Barbie, queen of dolls for over 40 years, lost a fifth of her realm almost overnight—and Mattel didn't see it coming.

Companies often face demographic shifts, new rivals, new technologies, new regulations, and other environmental changes that seem to come out of left field. How can they see these changes sooner and capitalize on them as MGA Entertainment did? How can they avoid being blindsided as Mattel was? The challenges faced by companies like Mattel often begin as weak signals at the periphery, the blurry zone at the edge of an organization's vision. As with human peripheral vision, these signals are difficult to see and interpret but can be vital to success or survival.

Managers are used to interpreting data that are set before them, but they also need to be able to recognize when part of the picture is missing—to answer the question, **"What don't we know that might matter?"** Drawing on research in strategy, organization and decision theory, and other disciplines, as well as our decade-long study of emerging technologies at Wharton's Mack Center for Technological Innovation and our work with organizations around the globe, we have developed a **"strategic eye exam."** It serves as a diagnostic tool for evaluating and sharpening companies' peripheral vision. We have administered the exam to senior executives in more than 150 companies around the world and have consulted with companies across industries—including agricultural equipment, media, energy, and software—to help them bring the periphery into focus.

As this article shows, improving peripheral vision begins by asking the right questions.

Defining Scope

How good does a company's peripheral vision need to be?

For many businesses, the status quo isn't good enough. Our survey of global senior managers found that 81% perceived their future need for peripheral vision to be greater than their current capacity. A survey of 140 corporate strategists conducted by the Fuld-Gilad-Herring Academy of Competitive Intelligence found that fully two-thirds had been surprised by as many as *three* high-impact competitive events in the past five years. In addition, 97% of the respondents said their companies lacked an early warning system.

This doesn't mean, however, that every company needs to boost its surveillance of the periphery. It's important to match capability with need. Companies in complex, rapidly changing environments require well-developed peripheral vision; those in relatively simple, stable environments have less of a need. In fact, companies that have too much peripheral vision can end up being neurotic, wasting resources by focusing on unimportant signals. (To assess your company's need and capability for peripheral vision, see the exhibit "How Is Your Peripheral Vision? A Strategic Eye Exam.")

How Is Your Peripheral Vision? A Strategic Eye Exam

Whether your organization needs better peripheral vision depends on your current capability for it as well as your strategy, the nature of your business, and your industry environment.

The following exam can help you assess your organization's need and capacity for peripheral vision:

- Ask each member of the senior management team to take the exam.
- Have them score each item from 1 to 7.
- Add up the totals for sections I, II, and III to arrive at a score for "need." Add up sections IV, V, VI, VII, and VIII to arrive at a score for "capability."
- Look for differences in scores among team members, and discuss why these might have occurred.
- Arrive at a consensus on the most accurate scores for "need" and "capability" for your organization.
- Using "The Peripheral Vision Scoring Tool," determine whether your organization is vulnerable, vigilant, focused, or neurotic.

You can receive benchmarking data about how your scores compare with those of more than 150 other companies by taking the electronic version of this survey at www.thinkdsi.com.

Assess Your **Need** for Peripheral Vision

✎ I **NATURE OF YOUR STRATEGY**   (circle a number)

Ⓐ Focus of your strategy

Narrow (protected niche)   1 2 3 4 5 6 7   Broad (global)

Ⓑ Growth orientation

Modest   1 2 3 4 5 6 7   Aggressive

Ⓒ Number of businesses to integrate

Few   1 2 3 4 5 6 7   Many

Ⓓ Focus on reinvention

Minor   1 2 3 4 5 6 7   Major (50% of revenue must come from new products in three years)

Total (add numbers)   [   ]

✎ II **COMPLEXITY OF YOUR ENVIRONMENT**

Ⓐ Industry structure

Few, easily identifiable competitors   1 2 3 4 5 6 7   Many competitors from unexpected sources

Ⓑ Channel structure

Simple and direct   1 2 3 4 5 6 7   Long and complex

Ⓒ Market structure

Fixed boundaries and simple segmentation   1 2 3 4 5 6 7   Fuzzy boundaries and complex segmentation

Ⓓ Enabling technologies

Few and mature (simple systems)   1 2 3 4 5 6 7   Many converging (complex systems)

Ⓔ Regulations (federal, state, etc.)

Few or stable   1 2 3 4 5 6 7   Many or changing rapidly

Ⓕ Public visibility of industry

Largely ignored   1 2 3 4 5 6 7   Closely watched by media or special-interest groups

Ⓖ Dependence on government funding and political access

Low: operates largely independent of government   1 2 3 4 5 6 7   High: sensitive to politics and the funding climate

Ⓗ Dependence on global economy

Low: affected principally by domestic conditions   1 2 3 4 5 6 7   High: affected by global conditions

Total (add numbers)   [   ]

✎ III VOLATILITY OF YOUR ENVIRONMENT

Ⓐ Number of surprises by high-impact events in past three years

| None | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Three or more |

Ⓑ Accuracy of past forecasts

| High: small deviations from actual forecasts | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Low: results differ greatly from forecasts |

Ⓒ Market growth

| Slow and stable | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Rapid and unstable |

Ⓓ Growth opportunities

| Have decreased dramatically in past three years | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Have increased dramatically in past three years |

Ⓔ Speed and direction of technological change

| Very predictable | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Highly unpredictable |

Ⓕ Behavior of key competitors, suppliers, and partners

| Very predictable | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Highly unpredictable |

Ⓖ Posture of key rivals

| Live-and-let-live mentality | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Hostile (aggressive) |

Ⓗ Susceptibility to macroeconomic forces

| Low sensitivity to price changes, currencies, business cycles, tariffs, etc. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | High sensitivity to price changes, currencies, business cycles, tariffs, etc. |

Ⓘ Dependence on financial markets

| Low | 1 | 2 | 3 | 4 | 5 | 6 | 7 | High |

Ⓙ Customer and channel power

| Low | 1 | 2 | 3 | 4 | 5 | 6 | 7 | High |

Ⓚ Sensitivity to social changes (fashion and values)

| Low: mostly gradual change from the past | 1 | 2 | 3 | 4 | 5 | 6 | 7 | High: good chance of major disruptions and changes in business models |

Ⓛ Potential for major disruptions in the next five years

| Low; few surprises expected mostly things we can handle | 1 | 2 | 3 | 4 | 5 | 6 | 7 | High: several significant business shocks are expected, without knowing which in particular |

Total (add numbers) [   ]

Assess Your **Capability** for Peripheral Vision

✎IV YOUR LEADERSHIP ORIENTATION

Ⓐ Importance of the periphery in the business leader's agenda

| Low priority | 1 2 3 4 5 6 7 | High priority |

Ⓑ Time horizon overall

| Emphasis on short term (two years or less) | 1 2 3 4 5 6 7 | Emphasis on long term (more than five years) |

Ⓒ Organization's attitude toward the periphery

| Limited and myopic: few people care | 1 2 3 4 5 6 7 | Active and curious: systematic monitoring of periphery |

Ⓓ Willingness to test and challenge basic assumptions

| Mostly defensive | 1 2 3 4 5 6 7 | Very willing to test critical premises or widely held views |

Total (add numbers) [ ]

✎V YOUR KNOWLEDGE MANAGEMENT SYSTEMS (ESPECIALLY COMPETITIVE INTELLIGENCE AND CUSTOMER DATABASES)

Ⓐ Quality of data about events and trends at the periphery

| Poor: limited coverage and often out-of-date | 1 2 3 4 5 6 7 | Excellent: broad coverage and timely |

Ⓑ Access to data across organizational boundaries

| Difficult: limited awareness of what is available | 1 2 3 4 5 6 7 | Relatively easy: wide awareness of what is available |

Ⓒ Use of database for existing business

| Limited | 1 2 3 4 5 6 7 | Extensive |

Ⓓ Technologies for posing queries to databases

| Old and difficult to use | 1 2 3 4 5 6 7 | State-of-the-art inquiry systems |

Total (add numbers) [ ]

✎ VI YOUR STRATEGY MAKING

Ⓐ Experience with uncertainty-reducing strategies (e.g., real options)

Limited	1	2	3	4	5	6	7	Extensive

Ⓑ Use of scenario thinking to guide strategy process

Never	1	2	3	4	5	6	7	Frequent

Ⓒ Number of alliance partners

Few	1	2	3	4	5	6	7	Many

Ⓓ Flexibility of strategy process

Rigid, calendar driven	1	2	3	4	5	6	7	Flexible, issues oriented

Ⓔ Resources devoted to scanning the periphery

Negligible	1	2	3	4	5	6	7	Extensive

Ⓕ Integration of customer and competitor information into future technology platforms and new-product development plans

Poorly and sporadically integrated	1	2	3	4	5	6	7	Systematically and fully integrated

Total (add numbers) [ ]

✎ VII YOUR ORGANIZATIONAL CONFIGURATION (STRUCTURE AND INCENTIVES)

Ⓐ Accountability for sensing and acting on weak signals

No one is responsible	1	2	3	4	5	6	7	Responsibility is clearly assigned to project team or dedicated group

Ⓑ Early warning systems and procedures

None	1	2	3	4	5	6	7	Extensive and effective

Ⓒ Incentives to encourage and reward wider vision

None	1	2	3	4	5	6	7	Recognition from senior management and direct rewards

Total (add numbers) [ ]

✎ VIII YOUR CULTURE (VALUES, BELIEFS, AND BEHAVIORS)

Ⓐ Readiness to listen to reports from scouts on the periphery

Closed: listening discouraged	1	2	3	4	5	6	7	Open: listening encouraged

Ⓑ Willingness of customer-contact people to forward market information

Poor	1	2	3	4	5	6	7	Excellent

Ⓒ Sharing of information about the periphery across functions

Poor: information ignored or hoarded	1	2	3	4	5	6	7	Excellent: ongoing information-sharing at multiple levels

Total (add numbers) [ ]
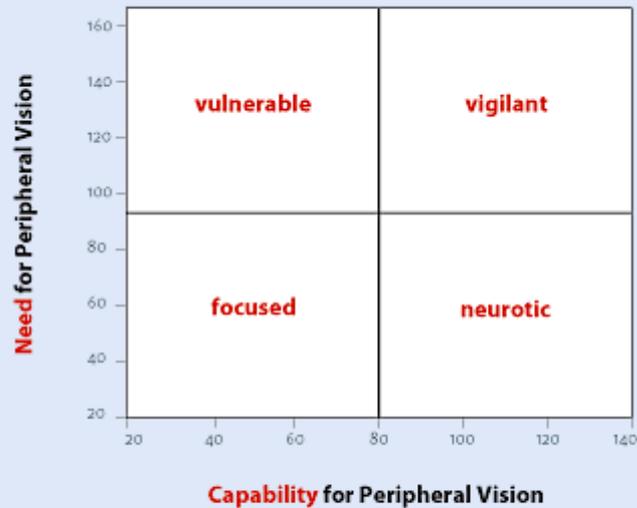
Locate your total "need" score on the Scoring Tool's vertical axis; locate your total "capability" score on the horizontal axis. Plot a point in the quadrant where the need and capability scores intersect. For example, a "need" score of 130 and a "capability" score of 50 place a company at the center of the "vulnerable" quadrant. If your organization is vigilant or focused, you don't need to do anything different from what you're already doing, although you should stay alert for changes in the environment that may increase your need for peripheral vision. If your organization is neurotic, you should look for ways to narrow its focus. If it's vulnerable, you should actively cultivate better peripheral vision, beginning with the guiding questions outlined in this article.

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Once an organization has defined the scope of the peripheral vision it needs, it then must determine how to scan within this field of vision. What are the questions it should address?

Asking the Right Questions

When a company examines its main areas of focus, its questions are targeted and the answers precise: What is our market share? What are our profits? Have our sales volumes increased? What is our employee turnover? What are our rivals up to?

Organizing for Scanning

Whose job is it to ask questions about the periphery?

In many organizations, the periphery is everybody's responsibility—and nobody's. There are several ways companies can focus their eyes on the margins and create accountability.

All of these ways, it must be emphasized, start with a mandate from the top.

- **Assign the responsibility to an existing functional group.**

Groups such as corporate development, competitor intelligence, market research, or technology forecasting can be given the task of scanning. The risk is that these midlevel groups may limit themselves to collecting and processing data from the domains they know best rather than scanning broadly and educating others about what they have learned.

- **Mobilize ad hoc issue groups.**

The CEO or executive committee, along with the board, identifies the most important questions to address and forms separate task forces to pursue each question. This process is often guided by a scenario analysis that identifies key uncertainties to be understood and monitored.

- **Create a high-level lookout.**

IBM has an ongoing capability called Crow's Nest, a team that scans specific topics at the periphery, such as customer diversity and collaborative networks, and shares its insights with top management. The group's responsibility is to rise above functional and product blinders and act as lookouts for new land and dangerous reefs ahead.

- **Start new initiatives.**

To focus managers' attention on the periphery, Royal Dutch/Shell began its Game Changer program in 1996. It was designed to encourage managers to envision and test hypotheses about new opportunities beyond the core. In its first six years, the program screened 400 ideas, commercialized more than 30 technologies, and created three new businesses.

- **Invest in start-up ventures.**

Most large companies in the technology sector have a pool of capital to invest in promising start-ups. These investments may be modest stakes but sufficient enough to get a clear view of any emerging technologies and their markets. If a start-up succeeds, then an option to acquire can be exercised.

- **Outsource.**

The organization can also outsource responsibility for peripheral vision to consultants, who can help predict what factors could transform the firm's business. While these outside partners can provide fresh perspectives, the company needs to pay careful attention to coordination to ensure that the insights of these "private eyes" are incorporated into strategic decision making.

These and other ways to structure scanning activities are often combined. For example, the U.S. Central Intelligence Agency has brought together a Crow's Nest–type group to identify potentially important technologies and a venture fund (In-Q-Tel) to seek out and invest in such technologies. To ensure it is taken seriously by the agency's other departments, the scanning group reports to the director.

Its primary activity is to link agency management and In-Q-Tel, an internal but separate group. By bringing together the scanning group and the venture fund, the organization can more effectively search out and respond to opportunities created by emerging technologies. And because In-Q-Tel has access to Tier 1 venture capital companies, the CIA can get involved during a technology's earliest stages, when it's possible to shape it to the agency's needs.

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But the questions used to examine the periphery need to be much more open-ended and the answers far less precise. For example, as part of Johnson & Johnson's strategy process, the organization's executive committee and members of a strategy task force asked themselves, What will the demographics of 2010 look like? What will a typical doctor's office look like? What role will governments play? What role will payers play?

The following questions can help guide scarce scanning resources to those places most likely to reveal hidden opportunities or threats. The questions, tested in more than 50 strategy development sessions and strategy post mortems globally, are organized around the past, present, and future. This has proved to be a natural and thorough way to cover the vast terrain.

Learning from the Past.

While the past may not be the most reliable predictor of the future, it can point out blind spots in your company or industry, as well as lessons from other industries. Those who fail to learn these lessons will be slow to see future opportunities and threats.

What have been our past blind spots? What is happening in these areas now?

Start a few decades back and systematically list all the social, technological, economic, environmental, and political changes that occurred in and around your industry. Which ones did management miss that have had major consequences for the organization? The purpose of this profiling is to see how well your company has responded to external changes (were you behind, abreast of, or ahead of them?) and to identify persistent blind spots in certain areas. Maybe you were well attuned to political changes, for instance, but repeatedly missed key competitive developments.

Consider DuPont's experience in the 1990s. Early in the decade, DuPont executives began seeing a disturbing pattern of slowed growth across its businesses, in the old stalwarts like Dacron polyester and in newer businesses such as nylon engineering resins. As sales declined and competition intensified, large segments of the markets for these businesses were unwilling to pay a price premium for DuPont's superior products. Each of DuPont's businesses independently decided to focus on the more profitable high ends of their markets, conceding the low-price markets to new rivals emerging from the periphery. These low-end entrants were able to parlay increased volume into ever lower costs.

DuPont's systemic myopia about the significance of low-end competitors, and its resulting strategic retreats from markets, led to sagging capacity utilization and increased unit costs. This, in turn, made the company even more vulnerable to low-price competition. To learn from the past and better prepare for further attacks from below, a group of business managers got together to evaluate this new threat and the company's successful and unsuccessful responses. As they came to understand the threat and why the multiple business units had missed it, they developed processes for anticipating low-end competitive threats early and for developing pre-emptive strategies. This group of managers became the nucleus of an organization-wide learning network that went on to identify and eliminate the root causes of the company's collective blind spot.

Is there an instructive analogy from another industry?

Find an analogous industry or market situation where companies have been blindsided from the periphery or have exploited an emerging opportunity. Consider nanotechnology. This emerging technology has shown abundant promise—as did genetically modified foods in Europe before activists fanned the fears of consumers and retailers began resisting. What can nanotech developers learn from the GMO (genetically modified organism) debacle? The potential social, legislative, and ethical issues raised by nanotechnology have some similarities to those that have bedeviled GMOs.

Preliminary toxicity studies, for example, have already raised alarm about the possible health hazards from nanoparticles. What's more, the potential use of nanotech-based sensors and tracers for food labeling raises privacy concerns. And nanotech developers are large, global firms whose motives are often regarded with suspicion—a fact that could be exploited by activists trying to attract media attention and financing. Finally, there are no uniform rules governing the release and control of nanomaterials, which could invite scrutiny and regulatory oversight.

The opposition to GMOs took root in large part because the public could easily imagine GMO hazards but could not see clear benefits from the technology. It follows that if the nanotech industry expects consumers to accept risks, it must also demonstrate tangible benefits. Are there analogies to the introduction of other controversial technologies, such as nuclear power, that might also be instructive for nanotechnology? Are there analogies to technologies that were more successful, such as the biotech and PC revolutions? Searching for suitable analogies helps managers see their situations through new lenses and can reveal unexplored risks and opportunities.

Who in your industry is skilled at picking up weak signals and acting on them ahead of everyone else?

If an organization in your industry has repeatedly done a good job of detecting and acting on signals from the periphery before others, you may want to emulate some of its practices. Did your competitor succeed because some key leaders asked the right questions, or did the organization's knowledge management system flag unusual occurrences? For example, Anheuser-Busch was one of the pioneers in the low-carb category, launching Michelob Ultra in September 2002.

It rapidly became the leader, capturing 5.7% of the light-beer market by March 2004. The company jumped on this wave early and rode the upsurge of the low-carb trend. Coors, in contrast, didn't enter until March 2004, when Michelob Ultra began eroding share for Coors Light, 18 months behind Anheuser-Busch. The new Coors brand, Aspen Edge, was too little, too late, despite the company's $30 million investment in the launch. Sales peaked at just 0.4% of the beer market in July 2004 before sliding.

What did Anheuser-Busch see that Coors didn't? Although the concept of light beers had been around for decades (Anheuser-Busch first began considering lower-calorie beers in the early 1960s), company research in the 1980s showed that consumers would be interested in a "healthier" beer. Over the years, the company discussed a variety of ways to create such a product, including adding vitamins. So when the low-carb trend emerged, the groundwork Anheuser-Busch was already doing allowed it to pick up the low-carb signal at a time when other brewers were promoting their beers' brand associations.

Benchmarking against the past is at best a starting point, a way to catch up and reduce your vulnerability to surprises. But to truly benefit from the periphery in a competitive sense, you will also need to examine the present and future.

Examining the Present.

Research shows that we filter and ignore large amounts of information that reach our senses. While this filtering often serves us well by cutting through the clutter of irrelevant stimuli, it can also exclude essential information from our perception. The following questions will help you focus on important information that you may be missing as you evaluate your environment.

What important signals are you rationalizing away?

Nearly all surprises have visible antecedents. However, people have a powerful tendency to ignore warning signals that contradict their preconceptions. Such rationalization may have delayed Mattel's recognition of the threat from the Bratz line; the company may have believed its Barbie franchise was invulnerable. Similarly, Coors was slow to react to the low-carb diet revolution because it failed to consider that a diet trend could be important in the alcoholic-beverage industry. And the assumption that falling foam insulation posed no serious threat to the space shuttle—an attitude the Columbia Accident Investigation Board called the "normalization of deviance"—unfortunately had catastrophic results.

In assessing the current environment, managers must **separate signals from noise**. It is not practical for them to assess each weak signal, and there is no simple formula for sharpening intuition. But managers should entertain the notion that they are missing important signals, seek insights about those signals throughout the organization, and make important judgment calls about the degree of attention the signals demand. Managers should invite employees and senior executives, as well as those outside the company who can offer relevant perspectives—such as channel partners, vendors, and industry mavens—to identify signals that may warrant a closer look. (For example, the rise of the Atkins diet book on the best sellers' list might have been a signal that Coors employees or others could have brought to management's

attention.) The emphasis should be on developments that are outside the organization's main area of focus but potentially threatening to the core.

But how do you identify important signals? A good way, we've found, is to select a signal and fast-forward its development <u>using scenario planning or other future-mapping techniques</u>. For example, we used a scenario-planning process in the funeral services business to systematically identify a variety of weak signals that could transform the business. This industry, which consists of small local funeral homes and corporate entities that operate hundreds of funeral parlors across the country, faces a large number of uncertainties. There has been an increase in cremation, a shift from mourning to celebrating life, more remote service participation via video or the Internet, and a tendency to unbundle services (such as casket viewing and burial) with separate pricing of components. The implications of the shift toward celebrating life, for example, could change the role of a funeral director from one who *directs* a conventional funeral service to one who *facilitates* a highly personalized ceremony.

Though funeral directors surely are aware of life celebration memorials, it's easy to see how this weak signal could be rationalized away by a professional whose mental model of the business assumes that funeral activities revolve around mourning. To identify the relevant signals, the National Funeral Directors Association invited about 80 people to spend two days in a scenario-building workshop to map trends and uncertainties in their business. The participants were then asked to examine which combinations of these trends and changes might alter the playing field. The combinations varied by region and market, but each funeral director left with a clear list of signals to monitor in his or her locale. As a result of this exercise, for example, one director of a group of funeral homes created a new "family life center," designed for more personalized memorial services. It integrated a 50-inch, flat-screen television to display photos and videos during the service and live video streaming over the Web to allow remote participants to watch and send e-mail comments in real time from anywhere in the world. The funeral home also hired an event planner to support customized memorial services.

What are your mavericks and outliers trying to tell you?

Most organizations have maverick employees with insights about the periphery, but they rarely tap these individuals. Find informed people, either inside or out, who reject the conventional wisdom about your businesses. Maybe they are congenitally unhappy with the direction of the business, or maybe they are talented outliers with insights into new customers and technologies that give them an idea for a new business. What shifting winds are they feeling that the rest of the organization is missing? As Andy Grove notes in his book *Only the Paranoid Survive,* these mavericks usually have a difficult time explaining their visceral feelings to top management, who are usually the last to know.

Most organizations have maverick employees with insights about the periphery, but these individuals are rarely tapped.

It is also critical to talk to the rank and file and listen carefully to what these employees are saying. Wisdom doesn't always flow from the top down, of course, and so **listening for weak signals from within the organization is important**, too.

Effective leaders have wide internal as well as external networks. Some CEOs, for example, schedule periodic meetings with employees multiple levels below them specifically to listen for weak signals.

Consider how drugmaker Organon recognized the potential for a new antidepressant. The clinical trials for the company's new antihistamine failed to prove its efficacy as a treatment for hay fever and other allergies. But a secretary helping to administer the trials noted that some of the volunteers were particularly cheerful. This weak signal, which would have remained isolated at the periphery in many organizations, was brought to the attention of managers involved in the trial by the secretary who recognized its potential significance. Through chance and further research, the company discovered that this new drug was, in fact, an effective treatment for depression. Organon successfully developed the drug and, in 1974, marketed it as Tolvon.

There are many other examples of accidental drug discoveries in the pharmaceutical industry, from Alexander Fleming's penicillin to Pfizer's Viagra. Interestingly, Fleming discovered the penicillin mold in 1928, but he didn't fully grasp its significance. It was not until 1938, when Oxford University pathologist Howard Florey happened upon Fleming's paper, that penicillin's true value was appreciated. And it was another three years before Florey's team completed human tests that revealed penicillin's astonishing therapeutic power. The weak signal Fleming picked up went unexploited for more than a decade.

What are peripheral customers and competitors really thinking?

Most managers feel they have a good grip on the realities of their markets, but they are usually focused on their current customer base rather than the broader pool of all potential customers. Naturally, they are especially attentive to the customers contributing the most to current earnings.

But there's much to be learned from complainers and defectors. Both groups are expressing—albeit in different ways—that you're not meeting their needs. **Ask yourself why you are losing customers**. This is a fertile source of insights about the periphery, since most companies experience between 12% and 18% "churn," or defections, each year.

Lost-sales reports and post mortems on contracts won by competitors can be revealing, but only if those doing the pathology are open to digging deeply and sharing their learning. Organizations also need to encourage customer-contact people to share insights about customer dissatisfaction from their direct interaction with the market. Companies can also learn about customer dissatisfaction by monitoring blogs, chat rooms, and Web sites, such as www.ihatemicrosoft.com, devoted to panning a product or company. By trolling Internet chat rooms, for instance, Procter & Gamble discovered unsubstantiated rumors in December 1998 that its fabric deodorizer Febreze was harmful to pets. The company responded immediately, gathering support from the American Society for the Prevention of Cruelty to Animals and other respected authorities to defuse the rumor and avert a large-scale consumer backlash.

By focusing only on direct rivals, companies may obscure less immediate threats from the periphery. In industry after industry, from airlines and chemicals to mainframes, the long-run threats have typically come from those companies that offer cheaper rather than more sophisticated products or services (as DuPont's experience dramatically shows). The real competition for United Airlines, for example, proved to be regional players such as Southwest rather than the other legacy airlines such as American. Incumbents should ask what low-end producers could enter their price-sensitive markets from the periphery. Similarly, managers should ask what threatening moves their business partners might be making. Can they integrate forward or backward?

Envisioning New Futures.

Asking questions about the past and present provides crucial information but only a partial picture of what lies ahead. The following questions focus specifically on the future and so provide further guidance about how to effectively scan the periphery today.

What future surprises could really hurt (or help) us?

Start by asking yourself, What future surprises might affect our business in the same way that significant past surprises have? For example, in financial services, what change would be as big as the introduction of credit cards or the repeal of Glass-Steagall? If you are in a business related to home cooking, what inventions could rival the introduction of the refrigerator or microwave?

Sometimes managers picture an idealized future to envision the surprises that could give rise to it. In the 1970s, researchers at Bell Labs were asked to imagine that the entire Bell phone system had been destroyed. They were then challenged to envision the telephone of the future without worrying about present constraints or limitations. Unshackled from the past, the group dreamed up features such as voice mail, call forwarding, automated dialing, and voice commands. Although we take these features for granted now, they were radical concepts at the time. These ideas went far beyond what AT&T knew how to deliver, but they became the inspiration for developing new capabilities.

Managers can also reveal weak signals by asking themselves how they would attack their own businesses as a new market entrant, either by setting up an internal team or bringing in outsiders. Recently, a team of consultants imagined a new-generation car company by challenging the car industry's conventional approach. In effect, it imagined a next-generation carmaker that would sell mobility, not vehicles. This "virtual" carmaker would outsource almost all activities, from design to logistics to leasing to service. Parts would be made by a network of suppliers in low-wage countries. Assembly would be done in micro factories that would distribute low volumes of cars as close as possible to the local market. The company would lease the cars to customers and retain ownership for the life of the vehicle. Elements of this model—weak signals—already exist in a variety of industries.

What emerging technologies could change the game?

Companies are proficient at tracking developments in existing technologies that could affect their business. But this focus can deflect attention from emerging technologies that could be important in the future. To track these innovations, Clay Christensen has suggested focusing on the customer conditions that might drive their development. These conditions may be signaled by the needs of three groups of customers: those who are overserved and consider the existing solutions to be more than they need; those who are underserved by these solutions; and those on the fringe who lack the skills and resources to benefit from these solutions. If the music industry had analyzed these customer conditions circa 1996, when the Web was emerging, it might have seen peer-to-peer music file sharing early on and realized that it met an underserved need: the desire for online access to a large catalog of unbundled tracks. With that understanding, legitimate file-sharing models might have emerged sooner and headed off the free-for-all of illegal file swapping ignited by Napster.

The choice of which technologies to track depends on the company and industry, but there should be someone in the organization looking creatively at how new technologies could affect the business. This is what GE did with its "destroyyourownbusiness.com" initiative, in which business units were asked to apply Internet business models to destroy their current businesses. This moves the consideration of new technologies from a scientific curiosity to an explicit examination of the implications for the business. How far should managers go in looking at the horizon? Should they look at far-out ideas such as therapeutic cloning or mind-machine interfaces? What about Star-Trek-like matter transporters? Consider that most of the technologies that will affect the business in the short run—say, within a decade or so—are in a laboratory or journal somewhere right now, perhaps even in the company's own labs. It's unlikely that people will be beaming from place to place by 2015—this theoretical technology is a long way from the lab. But electrode implants are already allowing subjects to connect their brains with computers—and thus, presumably, with the Internet. That's a weak signal the gaming and telecommunications industries should probably be watching.

Is there an unthinkable scenario?

To see the full effect of potential future surprises, managers should develop at least one "unthinkable" scenario that, while remotely plausible, is so unlikely that it's easily dismissed as not worth considering. By explicitly entertaining these unthinkable possibilities—positive and negative—you can begin to recognize the many ways to interpret the signals in the current environment.

Without conscious intervention, the mind will naturally force fit any faint inclinations into pre-existing mental models. When subjects are shown a red spade in a deck of cards, for example, they often identify it as a heart because they force this anomalous card into the well-known model of the standard four suits. But a viewer who has entertained the possibility of a red spade may be able to see it.

In the early 1990s, one of us was helping the Venezuelan oil company Petróleos de Venezuela SA (PDVSA) construct future scenarios. The usual unknowns, from oil prices to export markets, received much of management's attention. But what

actually transpired in Venezuela was never envisioned in any of the scenarios. The emergence of the populist leader Hugo Chavez, who would take on the establishment, declare martial law, nationalize the oil company, and fire all the top executives one Sunday afternoon during a national TV address, was an "irrational" scenario. Could managers have seen the warning signs in the political landscape? In retrospect, yes, but this scenario was unthinkable, at least in the minds of PDVSA's leaders. Similarly, the fall of the Berlin Wall was an irrational scenario that was not taken seriously by many politicians and organizations.

By contrast, when the federal credit union for Enron was developing scenarios in 1999, managers reluctantly considered the outrageous possibility that its corporate parent might collapse. At the time, Enron was being praised around the world by investors, the press, and business gurus. But when this "unthinkable" scenario actually came to pass, the Enron Federal Credit Union was better able to react quickly and survive in part because it had entertained the possibility. Often the early warnings of pending turmoil are faintly visible at the periphery. Nonetheless, the credit union field has seen many cases where corporate sponsors suddenly vanished, usually not because of fraud but because of mergers and acquisitions, and the attached credit union often went down with the mother ship.

If you mine for these warning signs and then combine them into seemingly far-fetched scenarios, you may see the threats and opportunities at the periphery more clearly. Otherwise, you may simply dismiss or absorb the anomalies into your current worldview.

While the complexity of peripheral vision may defy simple recipes, our work has made it clear to us that such vision can be strengthened. These guiding questions are an important first step. Like being aware that a sudden outflow of the tide is a sign of a coming tsunami, recognizing these warning signs early can be a matter of life or death. Organizations with good peripheral vision can gain tremendous advantages over rivals. They can recognize and act on opportunities more quickly.

They can avoid being blindsided. It takes skill to do this well, but as the environment changes more quickly and becomes more uncertain, the payoffs from peripheral vision may be greater than ever.

As Charles Darwin said, "It's not the strongest of the species who survive, nor the most intelligent, but the ones most responsive to change."

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